

# Simultaneous V/S Staged Bilateral TKA

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# Question ?

- Bilateral knee osteoarthritis
- What to do ?
- Point of view : Scientific, financial, ethical
- Literature

# What to do?

## Bilateral knee osteoarthritis

### OPTIONS :

- Simultaneous bilateral TKA
- Staged :
  - same admission bTKA
  - separate admission bTKA (10 % patient: between 3 months → 1year: according to one article; no level one data in literature )

# Introduction

- 20 % of patients : bilateral knee osteoarthritis
- 1990 U.S. : 3.7% primary TKA  
Simultaneous b TKA
- 2015 U.S. : 6% primary TKA  
Simultaneous b TKA.

# Simultaneous V/S Staged BILATERAL TKA

Disadvantages ?

Advantages ?

# What are we talking about ? ( complications )

LITERATURE : simultaneous BTKA V/S  
unilateral

Is it the same group of Patients ?

Definitely it is not the same group of Patients  
(age, comorbidities ... )

# Unilateral V/S Bilateral TKA

Is there any intersection in term of complications? (simultaneous BTKA, staged BTKA, unilateral TKA)

- 37 % bilateral osteoarthritis (1) will not undergo the second stage of BTKA

(1) Sesen et al Knee Surg Sports Traumatol Arthrosc. 2015 Dec;23(12):3585-90. doi: 10.1007/s00167-014-3251-7. Epub 2014 Aug 29.

# Why simultaneous bTKA ?

- 95 % (1) simultaneous bTKA would recommend this procedure for others
- Patient satisfaction is high; good clinical outcome.
- Survivorship > 93% at 10 years
- Reducing exposure to repeated anesthesia

(1) J. Arthroplasty. 2003 Dec;18(8):972-8. [Leonard L1](#), [Williamson DM](#), [Ivory JP](#), [Jennison C](#).



# Why simultaneous bTKA?

- Financial cost : intuitively one hospital stay SHOULD be less expensive.
- Surgeon fees : less
- Hospital reimbursement: less
- What would happen if we have a complication? ( death= 1 million USD ???)

# surgeon concern simultaneous bTKA

- Bigger operation
- More complications ?

orthopedic complications.

non orthopedic complications.

# complications

- thrombo - embolic : PE , DVT
- Cardiac events: arrhythmia ,coronary...
- Blood loss: 4.1 g/dl; blood trans. : 3units. (simult.)
- Pulmonary infection
- Neuro: confusion...
- Surgical site infection
- Mortality

# LITERATURE complications

Sim. bTKA V/S unilateral TKA :

SUPPORT: unilateral

SUPPORT: bilateral

# Literature support unilateral TKA

- Lacombe et al:
  - cardiac complications : 3% v/s 1 %
  - Pulmonary complications : 7 % v/s 2%
  - infection : 6 % v/s 1 %
  - mortality and DVT : same

# Literature

## support unilateral TKA

- Lane et al :
  - cardio –pulmonary complications : 3 times greater simultaneous bTKA .
  - neuro complication (confusion ) : 24 % v/s 7% uni.
- Memtsoudes et al :
  - mortality 0.3 % v/s 0.14 % uni .

# Literature

## support simultaneous b TKA

- Barrett et al : thrombo \_embolic events : 1.44 % v/s 0.81 % b TKA .
- Welmesley et al : no difference in mortality rate
- Noble et al : most recent No difference in complications rate

# Meta-analysis

- Computerized English literature search ; 1996 – 2005 .
- Prospective studies
- PE : 1.8 greater simultaneous
- Cardio-pulmonary :2.49 greater simultaneous
- Mortality :2.2 greater simultaneous
- DVT lower simultaneous



# QUESTION ??

- Do we really compare apple to apple ??
- Is there any BIAIS in those data???

# Answer One (complications)

- Definitely we do not compare apple to apple because :
  - bilateral = two knees
  - unilateral = one knee
  - bilateral = two unilateral ???

$A = B + C$  ?????
- No data in the literature take this into consideration concerning complications rate .

## Answer two

- Definitely there is a BIAIS in inclusion criteria :
  - Patients : age , comorbidities..
  - Complications 1<sup>st</sup> op = 2<sup>nd</sup> operation
  - Experience : surgeon, anesth.
  - Hospital volume: management and prevention of complications .

# RIGHT QUESTION ?

- Which one is better ?

Simultaneous bTKA or staged bTKA :

patient reported outcome

morbidity

mortality

cost efficiency

# SIMULTANEOUS V/S STAGED PATIENT SATISFACTION

- Simultaneous 95% (1) would choose the same option (younger)
- Staged no data

(1) Leonard et al. J Arthroplasty. 2003 Dec;18(8):972-8.

# COMPLICATIONS RATE

Fu et al. j.of arthroplasty 2013

Eric et al. Acta orthop .2016

- HIGHER in sim . BTKA : mortality rate at 30 days, PE , blood transfusion
- LOWER in sim . BTKA : deep infection , revision rate
- SAME : neuro. Complications, sup .infections , DVT , cardiac complications .

# SIMULTANEOUS V/S STAGED only fact (COST)

- Simultaneous BTKA lower cost :  
53000 USD simultaneous  
72000 USD staged

The benefit of decreased cost outweigh the economic cost of potential complications.

[Benefits and risks of secondary data: Commentary on an article by Susan M. Odum, PhDc, et al.: "A cost-utility analysis comparing the cost-effectiveness of simultaneous and staged bilateral total knee arthroplasty". \[J Bone Joint Surg Am. 2013\]](#)

LIMITATIONS

SIMULTANEOUS

V/S

STAGED



# Unilateral V/S staged bilateral TKA intersection

- MORTALITY in staged BTKA is underestimated : patient who died was included in the unilateral group.
- COMPLICATIONS and REVISIONS of staged bilateral group who declined to do the second stage where included in unilateral group.
- UNHAPPY patients in staged bilateral group who decided not to do second knee will put them in the unhappy unilateral group.

# CONCLUSION 1

- Methodology in these studies makes it impossible to draw a firm conclusion.
- Valid comparison between simultaneous and staged TKA **WOULD** be only possible after adjustment of :
  - age, sex, comorbidities, hospital volume
- **THIS** does not exist in any study .

# CONCLUSION 2

- Lack of conclusive data (morbidity)
- Data CCJR 2016 Pangano :
  - Some surgeons and some patients will choose simultaneous bTKA
  - other will not .

# TAKE HOME MESSAGE

- KEY for Simultaneous bTKA :
  - Patient selection : age, comorbidities
  - efficient care and surgical pathway:
    - ❖ thorough pre – op assessment
    - ❖ optimal hospital care
    - ❖ aggressive post op rehab.

Thank You